Claims

What is claimed is:

1. A method of forming a ferroelectric capacitor comprising forming a crystalline PZT layer by a process including the steps of:

depositing a layer of amorphous ferroelectric material over a layer of a first material;

etching the ferroelectric layer to form isolated ferroelectric elements;

providing a layer of a second material on at least the side surfaces of the ferroelectric elements; and

performing an annealing step to crystallize the ferroelectric material;

the second material promoting crystallisation of the ferroelectric material to a higher degree than the first material, whereby the crystallisation proceeds horizontally through the ferroelectric elements.

2. A method according to claim 1 in which, prior to the annealing step, the ferroelectic elements are directly covered with a layer of a material which promotes crystallisation of the ferroelectric material to a lesser degree than the second material.

3. A method according to claim 1 in which the second material is TiO_2.

4. A method according to claim 3 in which the TiO_2 is formed by depositing Ti on at least the side surfaces of the ferroelectric elements, and oxidising the Ti to form TiO_2.

5. A method according to claim 4 in which the Ti is oxidised to TiO_2 by chemical reaction with the ferroelectric material.

6. A ferroelectric device including a ferroelectric capacitor produced by a method according to claim 1.

7. A method according to claim 1 further including depositing electrode elements of conductive material between the ferroelectric elements.

8. A method according to claim 1 in which the ferroelectric material is PZT.

9. A ferroelectric capacitor produced by a method according to claim 1.

10. A FeRAM memory device including a ferroelectric capacitor produced by a method according to claim 1.

11. A ferroelectric capacitor comprising:

a substrate having an upper surface;

crystalline ferroelectric elements formed over the substrate; and

electrical contacts on the sides of the ferroelectric elements;

the crystal boundaries of the ferroelectric elements extending substantially parallel to the surface of the substrate.

12. A FeRAM memory device including a ferroelectric capacitor according to claim 11.